

**Zeitschrift:** L'Enseignement Mathématique  
**Herausgeber:** Commission Internationale de l'Enseignement Mathématique  
**Band:** 27 (1981)  
**Heft:** 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

**Artikel:** TOWARDS A COMPLEXITY THEORY OF SYNCHRONOUS  
PARALLEL COMPUTATION

**Autor:** Cook, Stephen A.

**Bibliographie**

**DOI:** <https://doi.org/10.5169/seals-51742>

### **Nutzungsbedingungen**

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. [Siehe Rechtliche Hinweise.](#)

### **Conditions d'utilisation**

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. [Voir Informations légales.](#)

### **Terms of use**

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. [See Legal notice.](#)

**Download PDF:** 06.02.2025

**ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>**

## REFERENCES

- [AKLLR] ALELIUNAS, R., R. M. KARP, R. J. LIPTON, L. LOVÁSZ and C. RACKOFF. Random walks, universal traversal sequences, and complexity of maze problems. *Proceedings 20th Annual Symposium of Foundations of Computer Science*, Oct. 1979, pp. 218-223.
- [B1] BORODIN, A. On relating time and space to size and depth. *SIAM J. Comp.* 6 (1977), pp. 733-744.
- [BC] BORODIN, A. and S. COOK. A time-space tradeoff for sorting on a general sequential model of computation. *Proc. 12th Annual ACM Symposium on Theory of Computing*, April 1980, pp. 294-301.
- [BW] BURKS, A. W. and J. B. WRIGHT. Theory of logical nets. In: *Sequential Machines: Selected Papers*, E. F. Moore, ed., Addison-Wesley, 1964, pp. 193-212.
- [C1] COOK, S. A. Deterministic CFL's are accepted simultaneously in polynomial time and log squared space. *Proc. 11th Annual ACM Symposium on Theory of Computing*, May 1979, pp. 338-345.
- [CS] CHANDRA, A. K. and L. J. STOCKMEYER. Alternation. *Conference Record IEEE 17th Annual Symposium on Foundations of Computer Science*, 1976, pp. 98-108.
- [CKS] CHANDRA, A. K., D. C. KOZEN and L. J. STOCKMEYER. Alternation. IBM Research Report RC 7489, 1978.
- [D1] DYMOND, P. *Simultaneous Resource Bounds and Parallel Computation*. Ph.D. thesis, University of Toronto, Dept. of Computer Science, 1980.
- [FW] FORTUNE, S. and J. WYLLIE. Parallelism in random access machines. *Proc. 10th ACM Symposium on Theory of Computing*, May 1978, pp. 114-118.
- [G1] GOLDSCHLAGER, L. A unified approach to models of synchronous parallel machines. *Proc. 11th Annual ACM Symposium on Theory of Computing*, May 1978, pp. 89-94.
- [G2] ——— Synchronous parallel computation, Ph.D. thesis and TR-114, Dept. of Computer Science, Univ. of Toronto, December 1977.
- [H1] HOOVER, J. Some Topics in Circuit Complexity. M.Sc. thesis and TR-139/80, Univ. of Toronto, Dept. of Computer Science, Dec. 1979.
- [H2] HONG, J. W. On some space complexity problems about the set of assignments satisfying a boolean formula. *Proc. 12th Annual ACM Symposium on Theory of Computing*, April 1980, pp. 310-317.
- [HIM] HARTMANIS, J., N. IMMERMANN and S. MAHANEY. One-way log tape reductions. *19th Annual Symp. on Foundations of Computer Science*, Oct. 1978, pp. 65-71.
- [HS] HARTMANIS, J. and J. SIMON. On the power of multiplication in random access machines. *Proc. of the 15th Annual IEEE Symposium on Switching and Automata Theory*, New Orleans, October 1974, pp. 13-23.
- [HS2] HODES, L. and E. SPECKER. Lengths of formulas and elimination of quantifiers I. In: *Contributions to Mathematical Logic*, K. Schütte, ed., North Holland Publ. Co. (1968), pp. 175-188.
- [HU] HOPCROFT, J. E. and J. D. ULLMAN. *Introduction to Automata Theory, Languages, and Computation*. Addison-Wesley, 1979.
- [J] JONES, N. D. Space-bounded reducibility among combinatorial problems. *JCSS 11* (1975), pp. 68-85.

- [K1] KOZEN, D. On parallelism in Turing machines. *Proc. of the 17th Annual Symposium on Foundations of Computer Science*, Houston, Texas, Oct. 1976, pp. 89-97.
- [KL] KARP, R. M. and R. J. LIPTON. Some connections between nonuniform and uniform complexity classes. *Proc. 12th Annual ACM Symposium on Theory of Computing*, April 1980, pp. 302-309. (Also presented at the Specker Symposium on Algorithms and Complexity, Zurich, Feb. 1980).
- [LSH] LEWIS, P. M., R. E. STEARNS and J. HARTMANIS. Memory bounds for recognition of context-free and context-sensitive languages. *IEEE Conference Record on Switching Circuit Theory and Logical Design*, 1965, pp. 191-202.
- [MP] MULLER, D. E. and F. P. PREPERATA. Bounds to Complexities of Networks for Sorting and for Switching. *JACM*, vol. 22, No. 2 (April 1975), pp. 195-201.
- [N1] NECIPORUK, E. I. A Boolean Function. *Soviet Math. Dokl.* 7, 4 (1966), pp. 999-1000. Originally *Dokl. Akad. Nauk. SSSR* 169, 4 (1966), pp. 765-766.
- [P1] PIPPENGER, N. On simultaneous resource bounds (preliminary version). *Proc. 20th Annual Symposium on Foundations of Computer Science*, October 1979, pp. 307-311.
- [P2] PATERSON, M. S. An introduction to boolean function complexity. *Astérisque, Société Mathématique de France* 38-39 (1976), pp. 183-201.
- [P3] PIPPENGER, N. Fast simulation of combinational logic networks by machines without random-access storage. *Allerton Conf. on Comm. Contr. and Comp.* 15 (1977), pp. 25-33.
- [PS] PRATT, V. and L. STOCKMEYER. A characterization of the power of vector machines. *JCSS* 12 (1978), pp. 198-221.
- [R1] RUZZO, W. L. On uniform circuit complexity (extended abstract). *Proc. 20th Annual Symposium on Foundations of Computer Science*, Oct. 1979, pp. 312-318.
- [R2] RIVEST, R. L. The necessity of feedback in minimal monotone combinatorial circuits. *IEEE Trans. on Computers*, June 1977, pp. 606-607.
- [S1] SCHNORR, C. P. The network complexity and the Turing machine complexity of finite functions. *Acta Inf.* 7 (1976), pp. 95-107.
- [S2] SCHÖNHAGE, A. Storage modification machines. Technical Report, Mathematisches Institut, Universität Tübingen, Germany, 1979.
- [S3] SAVAGE, J. E. *The Complexity of Computing*. Wiley, 1976.
- [S4] SIMON, J. On feasible numbers. *Proc. 9th Annual ACM Symposium on Theory of Computing*, May 1977, pp. 195-207.
- [SS] SAVITCH, W. and M. STIMSON. Time bounded random access machines with parallel processing. *JACM* 26, January 1979, pp. 103-118.
- [W1] WYLLIE, J. C. The complexity of parallel computations. Ph.D. thesis and TR-79-387, Dept. of Computer Science, Cornell University, 1979.

( Reçu le 5 juin 1980 )

Stephen A. Cook

University of Toronto  
Department of Computer Science  
Toronto 181  
Canada